CALIFORNIA DEPARTMENT OF PUBLIC HEALTH
850 Marina Bay Parkway, Richmond, CA 94804

ENVIRONMENTAL MANAGEMENT BRANCH
Marine Biotoxin Monitoring Program

Monthly Marine Biotoxin Report

April 2011

Technical Report No. 11-14

INTRODUCTION:

This report provides a summary of biotoxin activity for the month of April, 2011. Ranges of toxin concentrations are provided for the paralytic shellfish poisoning (PSP) toxins and for domoic acid (DA). Estimates are also provided for the distribution and relative abundance of *Alexandrium*, the dinoflagellate that produces PSP toxins, and *Pseudo-nitzschia*, the diatom that produces domoic acid. Summary information is also provided for any quarantine or health advisory that was in effect during the reporting period.

Please note the following conventions for the phytoplankton and shellfish biotoxin distribution maps: (i) All estimates for phytoplankton relative abundance are qualitative, based on sampling effort and percent composition; (ii) All toxin data are for mussel samples, unless otherwise noted; (iii) All samples are assayed for PSP toxins; DA analyses are performed as needed (i.e., on the basis of detected blooms of the diatoms that produce DA); (iv) Please refer to the appropriate figure key for an explanation of the symbols used on the maps.

Southern California Summary:

Paralytic Shellfish Poisoning

Low numbers of *Alexandrium* were detected at a number of sites between San Luis Obispo and San Diego counties in April (Figure 1).

PSP toxins were detected at only one location in April (Figure 3). Mussels from offshore of

(Continued on Page 2)

Figure 1. Distribution of toxin-producing phytoplankton in Southern California during April, 2011.

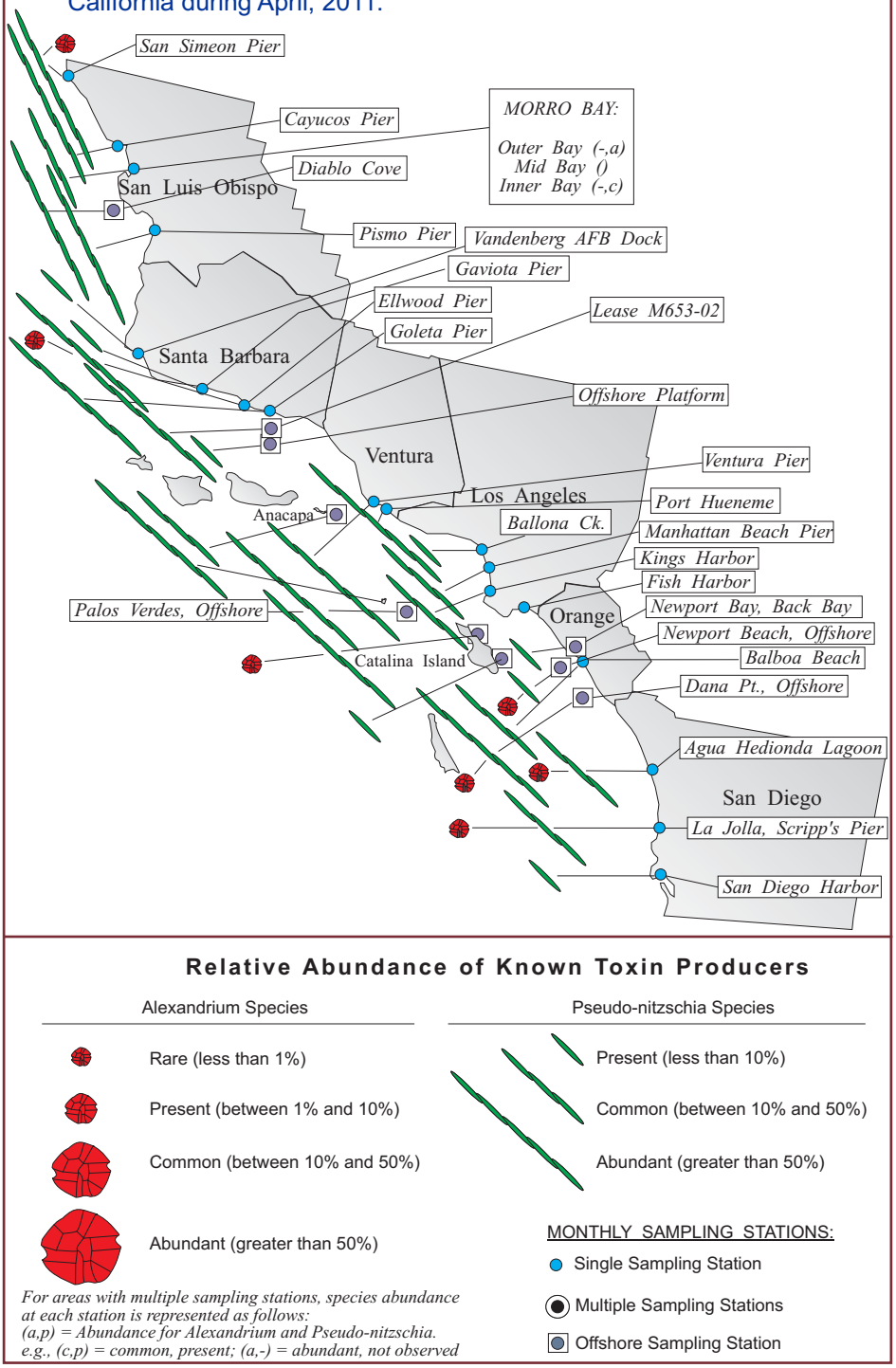
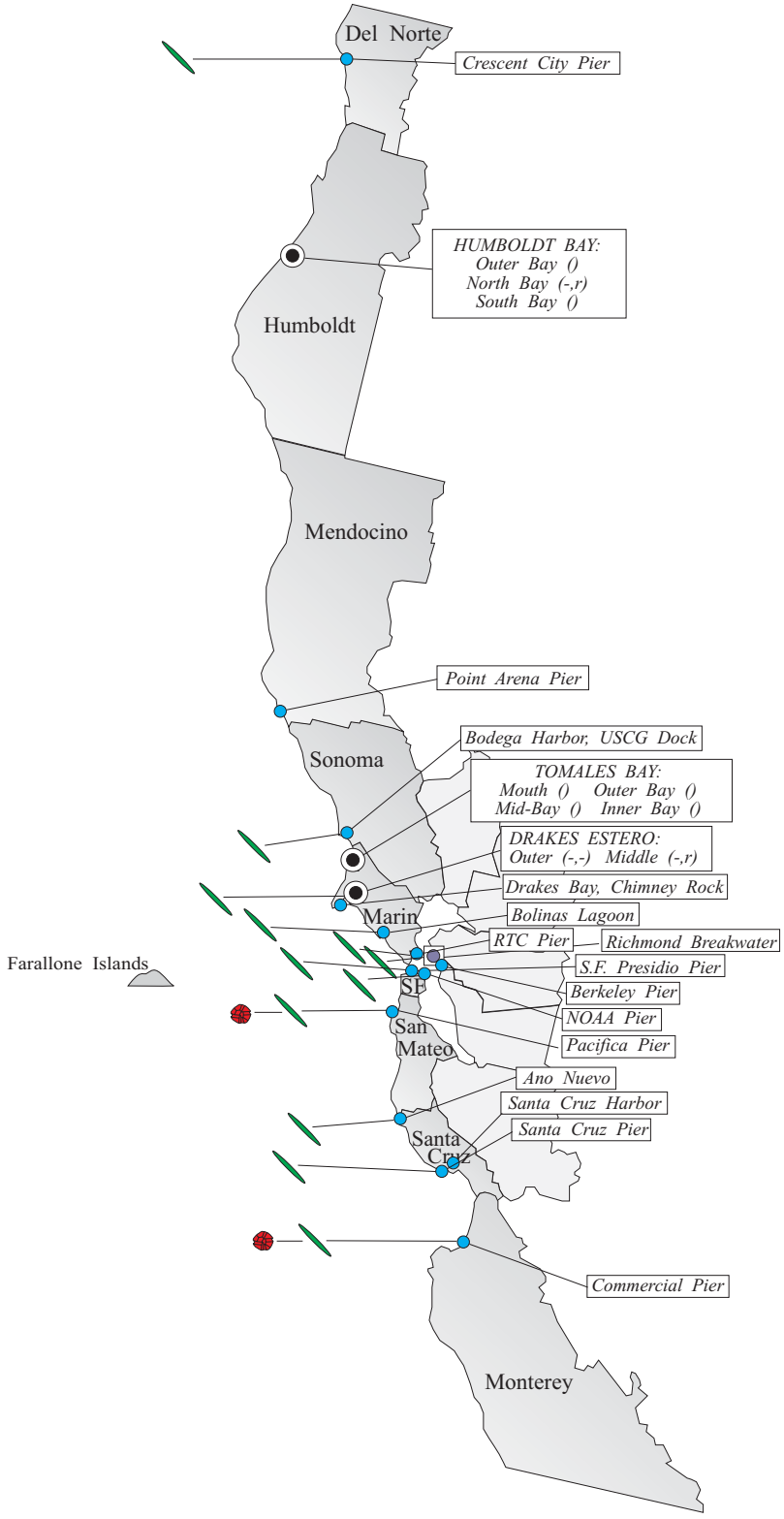


Figure 2. Distribution of toxin-producing phytoplankton in Northern California during April, 2011.



(Continued from Page 1)

Santa Barbara contained a low concentration of these toxins during the third week of the month.

Domoic Acid

Pseudo-nitzschia was observed along the entire southern California coast in April (Figure 1). The relative abundance of *Pseudo-nitzschia* increased significantly at several locations compared to observations in March. This diatom remained abundant offshore near Santa Barbara and Catalina islands. The highest relative abundances of this diatom were observed at San Simeon Pier (April 6), Cayucos Pier (April 5), Goleta Pier (April 13), and offshore of Palos Verdes (April 13).

Domoic acid was detected at numerous sites between San Luis Obispo and Ventura counties (Figure 3). Toxin levels exceeded the alert level at sites in San Luis Obispo and Santa Barbara counties. The Santa Barbara region experienced the highest toxin concentrations throughout the month, reaching 387 ppm on April 18 in oysters from an offshore aquaculture lease. Samples of rock crab viscera from offshore near Santa Cruz Island contained variable concentrations of domoic acid, ranging from nondetectable to moderate levels (27 ppm). Toxin levels declined below the alert level by the last week of April at the affected

(Continued on Page 3)

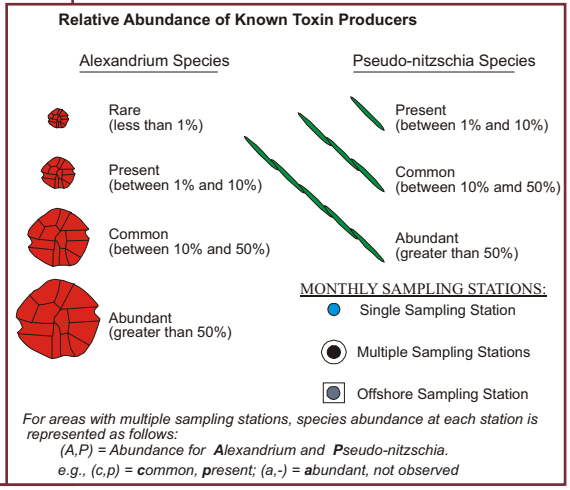
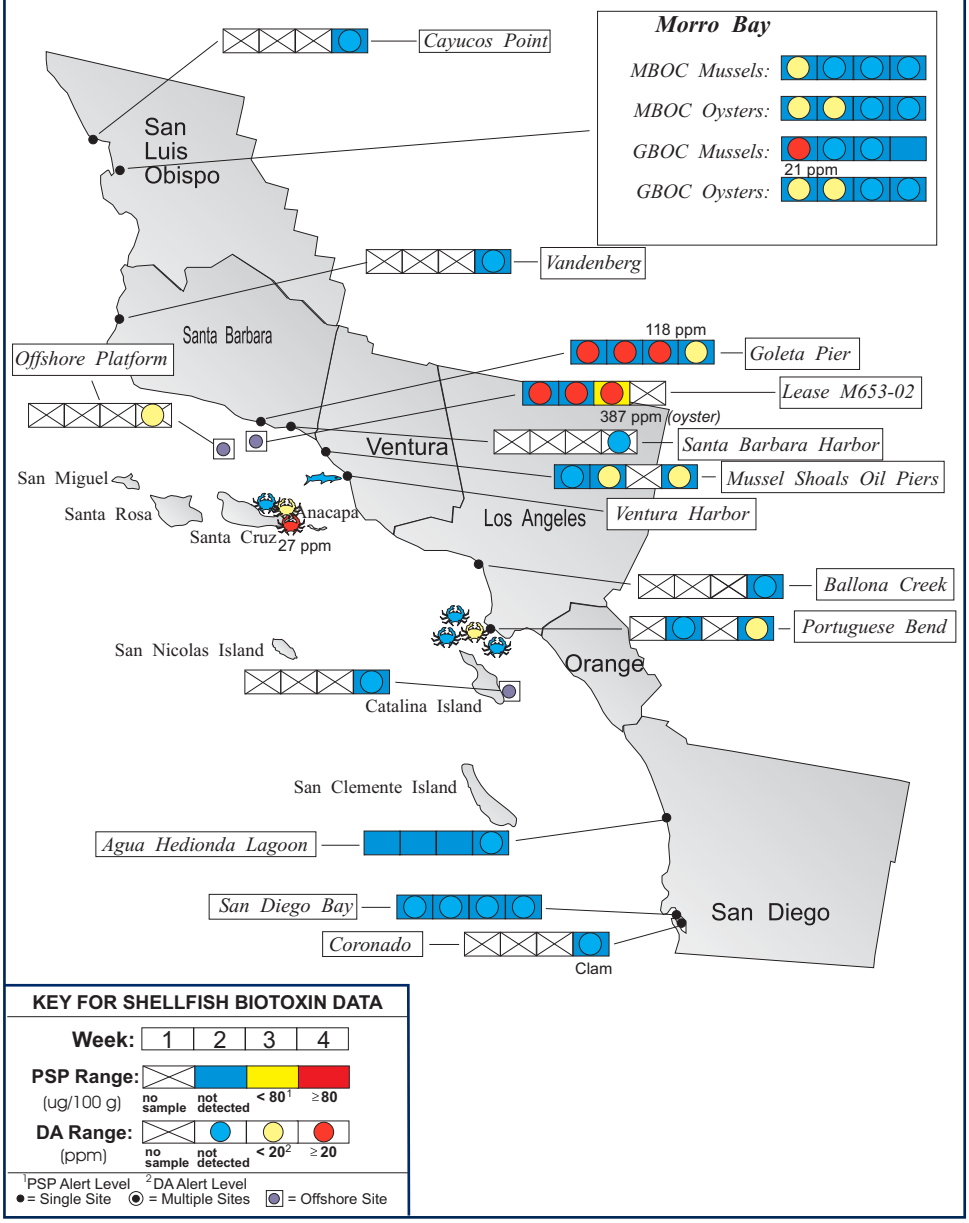


Figure 3. Distribution of shellfish biotoxins in Southern California during April, 2011.



(Continued from Page 2)

nearshore sites.

Non-toxic Species

As in past months *Pseudo-nitzschia* dominated the phytoplankton assemblage. In general diatoms were the most dominant group observed, with *Chaetoceros* prevalent at a number of sites and *Rhizosolenia* and *Guinardia* common to abundant along the Santa Barbara and Ventura coasts. The dinoflagellate *Prorocentrum* was common at sites in Orange and San Diego counties.

Northern California Summary:

Paralytic Shellfish Poisoning

Alexandrium was observed at only two sites in April (Figure 2), representing a decrease in distribution compared to observations in March. PSP toxins were not detected in any shellfish samples analyzed in April (Figure 4).

Domoic Acid

Pseudo-nitzschia was observed in very low numbers at sites along most northern California coastal counties (Figure 2). There was a significant decrease in this diatom at sites in Monterey Bay.

A low concentration of domoic acid was detected in razor clams from the Humboldt County coast.

(Continued on Page 4)

The Marine Biotoxin Monitoring and Control Program, managed by the California Department of Public Health, is a state-wide effort involving a consortium of volunteer participants. The shellfish sampling and analysis element of this program is intended to provide an early warning of shellfish toxicity by routinely assessing coastal resources for the presence of paralytic shellfish poisoning (PSP) toxins and domoic acid.

The Phytoplankton Monitoring Program is a state-wide effort designed to detect toxin producing species of phytoplankton in ocean water before they impact the public. The phytoplankton monitoring and observation effort can provide an advanced warning of a potential toxic bloom, allowing us to focus sampling efforts in the affected area before California's valuable shellfish resources or the public health is threatened.

For More Information Please Call:
(510) 412-4635

For Recorded Biotoxin Information Call:
(800) 553 - 4133

(Continued from Page 3)

Non-toxic Species

Diatoms were most numerous at a number of sites along the coast, and spring blooms were detected at several locations. The highest relative abundances were observed at Santa Cruz Pier (*Skeletonema*), Crescent City (*Chaetoceros, Thalassiosira*), and Bodega Harbor (*Chaetoceros*).

QUARANTINES:

The October 16 health advisory remained in effect, warning consumers not to eat sport-harvested shellfish or the internal organs of crustaceans and small finfish from the Channel Islands. Elevated levels of domoic acid were first detected in the viscera of lobster in this region and subsequently in rock crab viscera.

The 2011 annual mussel quarantine was initiated early due to the detection of elevated levels of toxins. When in effect, this quarantine prohibits the sport-harvesting of mussels along the entire California coastline, including all bays and estuaries. The annual quarantine does not apply to the certified commercial shellfish growing areas in California, which are monitored intensively throughout the year. All certified shellfish growers are required to submit at least weekly samples of shellfish for toxin monitoring. Harvest restrictions or closures are implemented as needed to protect the public's health. In addition, routine coastal phytoplankton and biotoxin monitoring is maintained throughout the quarantine period. Special quarantines or health advisories may be

(Continued on Page 5)

Figure 4. Distribution of shellfish biotoxins in Northern California during April, 2011.

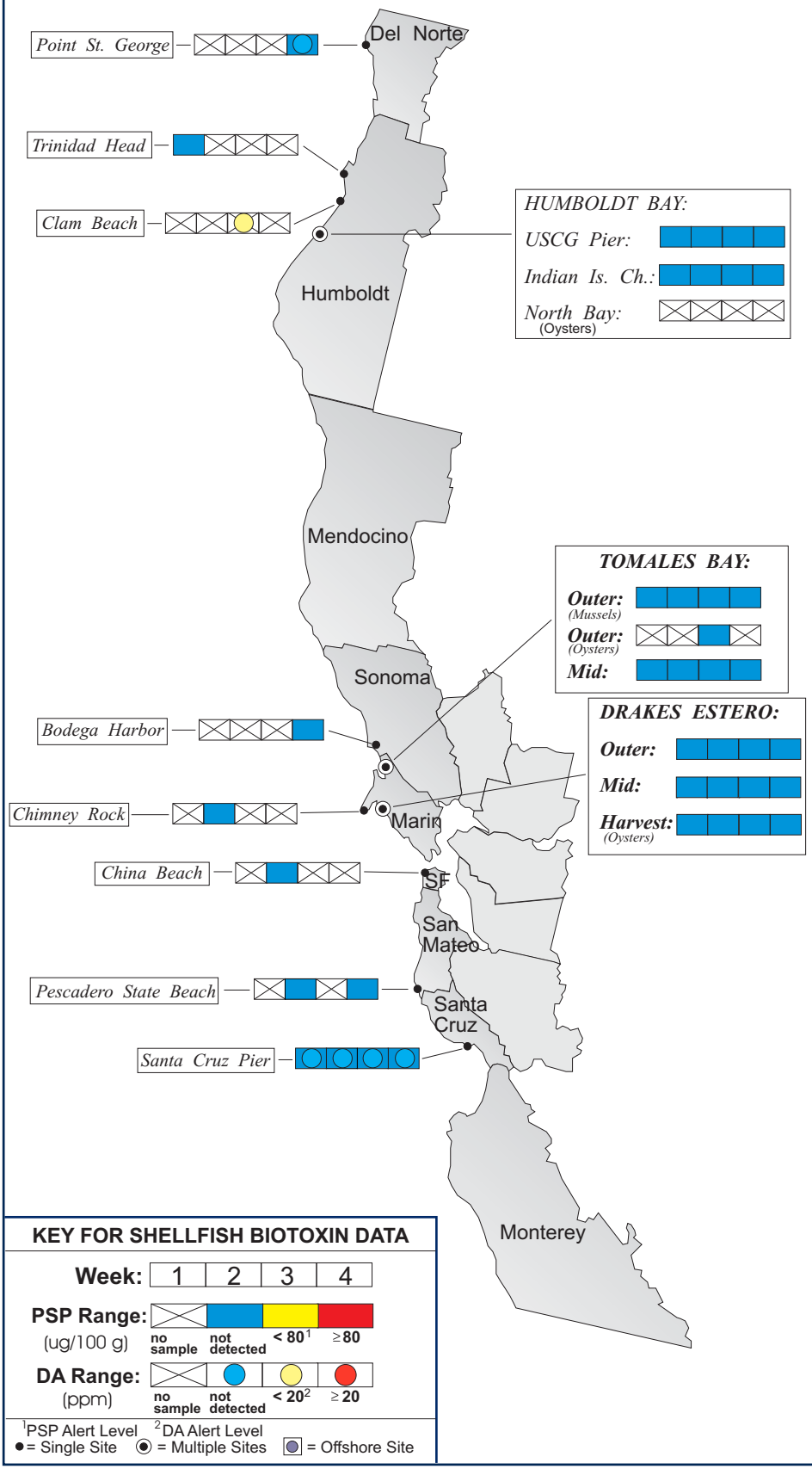


Table 1. California Marine Biotoxin Monitoring Program participants submitting shellfish samples during April, 2011.

COUNTY	AGENCY	#
Del Norte	Del Norte County Health Department	1
Humboldt	Coast Seafood Company	8
	Humboldt County Environmental Health Department	1
	Humboldt State University Marine Lab	2
Mendocino	None Submitted	
Sonoma	CDPH Marine Biotoxin Program	1
Marin	Cove Mussel Company	5
	Drakes Bay Oyster Company	16
	Hog Island Oyster Company	5
	Marin Oyster Company	1
	CDPH Marine Biotoxin Program	1
San Francisco	San Francisco Health Department	1
San Mateo	San Mateo County Environmental Health Department	2
Santa Cruz	U.C. Santa Cruz	4
Monterey	None Submitted	
San Luis Obispo	Grassy Bar Oyster Co.	14
	Morro Bay Oyster Company	9
	CDPH Marine Biotoxin Program	1
Santa Barbara	Santa Barbara Mariculture Company	8
	U.C. Santa Barbara	4
	Vandenberg AFB	1
	CDPH Marine Biotoxin Program	2
Ventura	Coastal Marine Biolabs	3
Los Angeles	Los Angeles County Health Department	3
	CDPH Volunteer (*Cal Parsons*)	1
Orange	None Submitted	
San Diego	Carlsbad Aquafarms, Inc.	4
	CDPH Volunteer (*Steve Crooke*)	1
	U.S. Navy Marine Mammal Program	4

(Continued from Page 4)

issued for additional seafood species as warranted by increasing toxin levels.

Consumers of Washington clams, also known as butter clams (*Saxidomus nuttalli*), are cautioned to eat only the white meat. Washington clams can concentrate the PSP toxins in the viscera and in the dark parts of the siphon and can remain toxic for a long period of time. Persons taking scallops or clams, with the exception of razor clams, are advised to remove and discard the dark parts (i.e., the digestive organs or viscera). Razor clams (*Siliqua patula*) are an exception to this general guidance due to their ability to concentrate and retain domoic acid in the edible white meat as well as in the viscera.

PSP toxins affect the human central nervous system, producing a tingling around the mouth and fingertips within a few minutes to a few hours after eating toxic shellfish. These symptoms typically are followed by disturbed balance, lack of muscular coordination, slurred speech and difficulty swallowing. In severe poisonings, complete muscular paralysis and death from asphyxiation can occur.

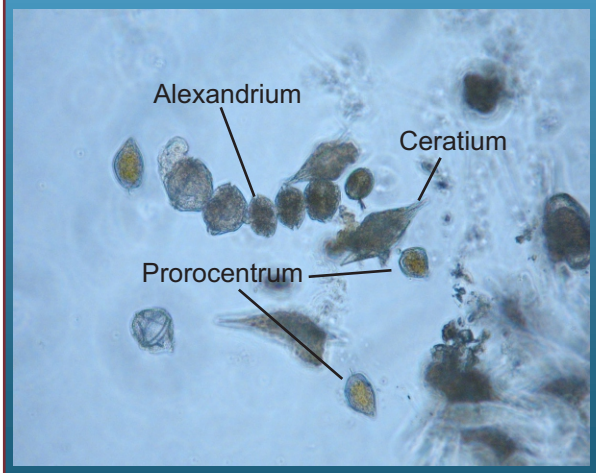
Symptoms of domoic acid poisoning can occur within 30 minutes to 24 hours after eating toxic seafood. In mild cases, symptoms of exposure to this nerve toxin may include vomiting, diarrhea, abdominal cramps, headache and dizziness. These symptoms disappear completely within several days. In severe cases, the victim may experience excessive bronchial secretions, difficulty breathing, confusion, disorientation, cardiovascular instability, seizures, permanent loss of short-term memory, coma and death.

Any person experiencing any of these symptoms should seek immediate medical care. Consumers are also advised that neither cooking or freezing eliminates domoic acid or the PSP toxins from the shellfish tissue. These toxins may also accumulate in the viscera of other seafood species such as crab, lobster, and small finfish like sardines and anchovies, therefore these tissues should not be consumed. Contact the "Biotoxin Information Line" at 1-800-553-4133 for a current update on marine biotoxin activity prior to gathering and consuming shellfish.

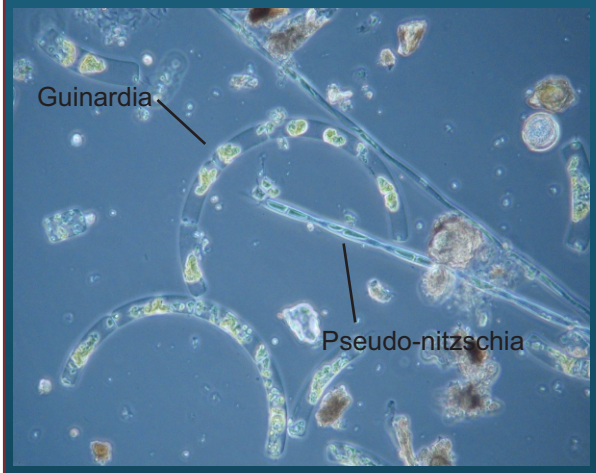
Table 2. Phytoplankton samplers for April 2011.

COUNTY	AGENCY	#
Del Norte	Del Norte County Health Department	2
Humboldt	Coast Seafood Company	4
Mendocino	CDPH Volunteer (*Marie De Santis*)	1
Sonoma	CDPH Volunteer (*Cathleen Cannon*)	1
	CDPH Marine Biotoxin Program	1
Marin	Drakes Bay Oyster Company	12
	CDPH Volunteer (*Brent Anderson*)	3
	CDPH Marine Biotoxin Program	2
	SFSU, Romberg Tiburon Center	3
Contra Costa	CDPH Marine Biotoxin Program	1
Alameda	CDPH Volunteer (*Ariel Durant*)	2
San Francisco	CDPH Volunteer (*Eugenia McNaughton*)	3
	Exploratorium	3
	San Francisco Health Department	2
San Mateo	San Mateo County Environmental Health Department	2
	The Marine Mammal Center (*Stan Jensen*)	4
	U.C. Santa Cruz	2
Santa Cruz	U.C. Santa Cruz	4
	San Lorenzo Valley High School	1
Monterey	Monterey Abalone Company	3
San Luis Obispo	Friends of the Sea Otter (*Kelly Cherry*)	4
	Morro Bay National Estuary Program	1
	Monterey Bay National Marine Sanctuary	3
	Tenera Environmental	1
	The Marine Mammal Center (*P.J. Webb*)	3
	CDPH Marine Biotoxin Program	1
Santa Barbara	CDPH Volunteer (*Sylvia Short*)	4
	Santa Barbara Mariculture Company	4
	Tole Mour (*Manhattan MS, Mira Costa HS, Monarch HS*)	5
	CDPH Marine Biotoxin Program	2
	U.C. Santa Barbara	4
	Vandenberg AFB	2
Ventura	CDPH Volunteer (*Fred Burgess*)	4
	Coastal Marine Biolabs	3
	National Park Service	2
Los Angeles	Los Angeles County Sanitation District	4
	Los Angeles County Health Department	3
	Los Angeles County Sanitation District	2
	CDPH Volunteer (*Cal Parsons*)	1
	Southern California Marine Institute	1
	Tole Mour (*Manhattan MS, Mira Costa HS, Monarch HS*)	4
Orange	California Department of Fish and Game	4
	Orange County Health Care Agency	2
	Ocean Institute	2
San Diego	Carlsbad Aquafarms, Inc.	4
	Scripps Institute of Oceanography	4
	U.S. Navy Marine Mammal Program	1

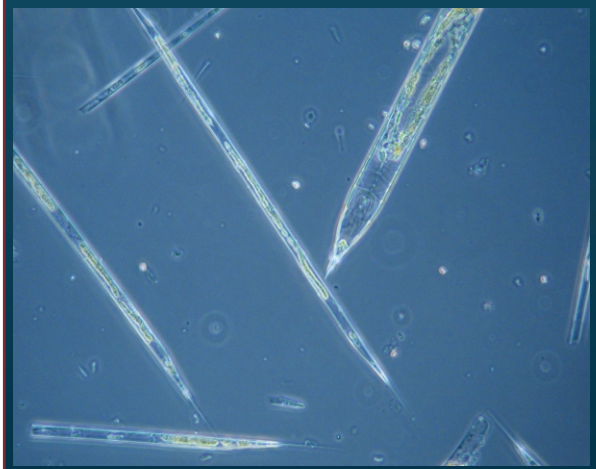
PHYTOPLANKTON GALLERY



A chain of the dinoflagellate Alexandrium from a southern California plankton sample.



As noted in March, the diatom Guinardia supplanted Pseudo-nitzschia along the Santa Barbara coast.



Rhizosolenia was common at sites in southern California.